Digitized by the Internet Archive
in 2017 with funding from
Queen's University Archives

https://archive.org/details/qucalendarapplsci1894

CALENDAR

OF THE

School of Mining and Agriculture

KINGSTON, ONTARIO.

· · · SESSION 1894-'95 · · ·

KINGSTON:
PRINTED AT THE BRITISH WHIG OFFICE,
1894.

Queen's University
Library

KINGSTON, ONTARIO

CALENDAR

OF THE

School of Mining and Agriculture

KINGSTON, ONTARIO.

· · · SESSION 1894-'95 · · ·

KINGSTON:
PRINTED AT THE BRITISH WHIG OFFICE,
1894.

1894/95

TABLE OF CONTENTS.

PAGE.

Calendar 3

Board of Governors—General Announcements 4

The School of Mining—Faculty—Registration—Occasional Students—Matriculation 5

Degree of M.E.—Fees—Course of Study for M.E 6

Subjects of Study for M.E 7

Course in Analytical Chemistry and Assaying—Prospectors' Course 13

Extramural Classes—Summer School of Science 15

Laboratories 17

Donations to Museums and Library 18

Pass List of Students 20

Navigation 21

The School of Agriculture—Dairying 22

Veterinary Department 23

CALENDAR.

1894.

July	4—Summer School of Science opens.
August	7—Summer School closes.
October	2—Classes in Mining open.
"	16—Holiday.
December	3—Classes in Navigation begin.
	22—Christmas Holidays begin.

1895.

January	8—Classes re-open. Prospectors' Course begins.
February	27—Holiday.
March	8—Prospectors' Course ends.
April	10—Class work closes.
"	13—Examinations begin.
May	1—Convocation for distributing prizes, announcing honours, and laureating graduates.

114179

VISITOR.

His Honour GEORGE A. KIRKPATRICK, D.C.L., LL.D., &c., Lieutenant-Governor of Ontario.

Chairman of the Board of Governors, J. B. CARRUTHERS, ESQ.
Vice-Chairman.....HIRAM A. CALVIN, M.P.

BOARD OF GOVERNORS.

J. B. CARRUTHERS, ESQ.....Kingston.
G. M. GRANT, LL.D., D.D.....Kingston.
HIRAM A. CALVIN, ESQ., M.P.....Kingston.
E. W. RATHBUN, ESQ.....Deseronto.
JAS. SWIFT, ESQ.....Kingston.
G. M. MACDONNELL, ESQ., B.A., Q.C.....Kingston.
E. J. B. PENSE, ESQ.....Kingston.
WM. HARTY, ESQ., M.P.P.....Kingston.
JAS. S. HAYDON, ESQ.....Centreville.
M. H. FOLGER, ESQ.....Kingston.
J. L. WHITING, ESQ.....Kingston.
GEO. Y. CHOWN, ESQ.....Kingston.
GEO. Y. CHOWN, B.A.....Treasurer.
A. P. KNIGHT, M.A., M.D.....Secretary.

GENERAL ANNOUNCEMENTS.

The School of Mining and Agriculture is incorporated by Act of the Legislature of Ontario.

The objects of the school are, to give a complete scientific education of both a theoretical and a practical character to young men studying for metallurgists or mining engineers; to give practical instruction to prospectors, mine foremen, and others interested in the discovery and winning of minerals; to lead prospecting excursions of the students as well as of those more directly interested in the development of mineral lands; and to provide theoretical and practical instruction in subjects pertaining to modern agriculture, such as dairying, veterinary science, and the chemistry, botany, and zoology of the farm.

THE SCHOOL OF MINING.

FACULTY.

Wm. L. Goodwin, B.Sc. (Lond.) D.Sc. (Edin.), F.R.S.C.,
Director and Professor of Chemistry.

William Nicol, M.A.,
Professor of Mineralogy, Metallurgy and Assaying.

Willet G. Miller, B.A.,
Lecturer on Geology and Petrography.

Wm. Hamilton Merritt, M.E., F.G.S., Associate Royal School of Mines, England,
Lecturer on Mining Engineering, The Economic Geology of Ontario, and The Discovery and Winning of Minerals.

R. Carr Harris, C.E.,
Professor of Engineering.

William Mason,
Lecturer on Freehand, Mechanical and Office Drawing, Topography and Surveying.

Joseph Bawden,
Lecturer on Mining Laws.

T. L. Walker, M.A., }
Dr. Isaac Wood, M.A., } Laboratory Demonstrators.

Registration.—All students are required to register at the beginning of each session.

Occasional Students.—Unmatriculated students may take any classes and examinations that they wish, as it is desired to give to persons who do not intend to follow engineering as a profession opportunities to receive the benefit of courses likely to be useful in common life.

Matriculation.—Candidates for a degree must pass the matriculation examination before being admitted to examination on the work of the course. Matriculation consists of the usual matriculation examination for Ontario in the subjects of English and Mathematics. The details of this examination may be found in the Calendars of Ontario Universities. Departmental certificates of mat-

riculation are accepted. Other matriculation examinations will be accepted so far as they are equivalent. Candidates who have made at least fifty per cent. on the honour papers in any of the University matriculation subjects are not required to take the junior class in that subject.

DEGREE.—The degree of Mining Engineer (M.E.) will be conferred on those who take the course specified hereafter and pass the required examinations. Examinations of other schools will be accepted *pro tanto*.

FEES.—Registration and Class fees must be paid annually on or before October 16, and Laboratory fees before students begin work in the laboratories.

Registration	$ 1 00
For the Course in Mining: first year	40 00
" " second "	50 00
" " third "	55 00
" " fourth "	55 00
Junior and Senior Chemistry, each	12 00
Any other Course of Lectures	8 00
Drawing	9 00
Surveying, per Session	5 00
Use of Laboratories for whole Session	25 00
" Chemical Laboratory only for Session	20 00
Analytical Chemistry (Medical)	12 00
Specialists' Practical Course in Qualitative Analysis, Blowpiping and Mineralogy	10 00
Elementary Mineralogy and Blowpiping	3 00
Graduation Fee	20 00
Annual Examination Fee	3 00

COURSE OF STUDY FOR M.E.—The course extends over four years and includes the following subjects :—

Junior English, Junior Mathematics, Modern Geometry, Higher Algebra, Solid Geometry, Plane Co-ordinate Geometry (1st course), Plane and Spherical Trigonometry, Differential and Integral Calculus (1st course), Junior and Senior Physics, Optics, Junior and Senior Chemistry (with Laboratory Practice), Qualitative and Quantitative Analysis, Blowpipe Analysis, Assaying, Mineralogy, Crystallography, Geology, Petrography, Ore Deposits, Mining, Ore Dressing, Metallurgy, Drawing and Designing, Materials and Construction, Surveying, Principles of Mechanism, Astronomy, and Civil Engineering (Elementary).

The following order of classes is advised :—

First Year.

Junior English, Junior Mathematics, Junior Physics, Junior Chemistry, Blowpipe Analysis, Drawing, Surveying.

Second Year.

Senior Physics, Modern Geometry, Solid Geometry, Plane and Spherical Trigonometry, Senior Chemistry, Qualitative Analysis, Mineralogy II, Crystallography, Drawing and Designing, Surveying.

Third Year.

Co-ordinate Geometry, Higher Algebra, Calculus, Optics, Astronomy, Geology, Petrography, Mineralogy III, Qualitative Analysis, Simple Quantitative Analysis, Materials and Construction, Mining, Engineering, Surveying.

Fourth Year.

Geology, Ore Deposits, Assaying, Mining, Ore Dressing, Metallurgy, Mechanism, Engineering, Surveying, Quantitative Analysis.

SUBJECTS OF STUDY.—The courses in English, Junior Mathematics, and Junior Physics are to be followed as found in Queen's University Calendar. In addition to the class of Senior Physics, students will be examined on:

Dupuis' Geometrical Optics, and Lloyd's Wave Theory of Light.

ADVANCED CLASSES IN MATHEMATICS.

Synthetic Modern Geometry. Dupuis' Geometry, parts III, IV, V.
Mondays at 4 P.M.

(1st term). Advanced Algebra. Dupuis' Algebra from chap. VI to the end. Hall and Knight's Algebra.

(2nd term). Plane Trigonometry preceding De Moivre's theorem—Problems and applications.
Tuesdays at 4 P.M.

(1st term). Synthetic Solid Geometry. Dupuis'.

(2nd term). Spherical Trigonometry and Astronomy.
Thursdays at 3 P.M.

Elementary Co-ordinate Geometry, and Conics.
Mondays at 11 A.M.

Elementary Differential and Integral Calculus.
Thursdays at 11 A.M.

CHEMISTRY.

Professor: William L. Goodwin, D.Sc., Edin.
Demonstrators: T. L. Walker, M.A., and I. Wood, M.A., M.D.

Junior.

Monday, Tuesday, and Wednesday, at 11 A.M.

Chemical Species—Crystals and Crystallisation—Chemica Change—Laws of Combination—Relations of Heat to Chemical Changes — Notation — Equations — Nomenclature—Volume relations of gases in Chemical Change—Volume Formulas — The Atomic Theory — Descriptive Chemistry of the non-metallic elements and their compounds—Electrolysis — Spectrum Analysis — Laboratory Practice.

Books: Goodwin's Chemistry (Henderson & Co., Kingston).
Remsen's Inorganic Chemistry (Advanced Course).

Senior.

1. Special Chemistry of the Metals, their occurrence in nature, reduction and uses.
2. Chemical Laws and Theories.
3. Crystallography.
4. Qualitative Analysis (Practical).

Books: Dobbin & Walker's Chemical Theory (Macmillan & Co.)
Goodwin's Chemistry, Supplement (Henderson & Co.)
Richter's Inorganic Chemistry (P. Blakiston, Son & Co.)
Williams' Crystallography (Henry Holt & Co.)
Thorpe & Muir's Qualitative Analysis (Longmans, Green & Co.)

Third Year.

1. Thermochemistry, Electrochemistry, Kinetic Theory of Gases.
2. Chemistry of Fuel, Ores, Fluxes, &c.
   Monday at 3 P.M.
3. Qualitative Analysis.
   Tuesday at 3 P.M.
   Wednesday 2-4 P.M.
   Friday at 2 P.M.
4. Qualitative Analysis of Minerals.
5. Simple Quantitative Analysis.

Books: Roberts-Austen's Metallurgy (Griffin & Co.)
Fresenius' Qualitative Analysis.
Hartley's Quantitative Analysis (Macmillan & Co.)

Fourth Year.

Quantitative Analysis.

Monday and Tuesday at 2 P.M.
Wednesday 2-4 P.M.

Books: Fresenius' Quantitative Analysis.
Leffman & Beam's Water Analysis.

Each student, before entering any practical class in chemistry, is required to deposit five dollars with the Bursar. On presenting to the instructor of the class the receipt for this, the student receives the key of his place. The deposit is returned at the end of the session, breakages, &c., having been deducted.

MINERALOGY.

Professor: William Nicol, M.A.

First Year.

Blowpipe Analysis—(*a*) A course of practical demonstrations to illustrate and explain reactions in studying the chemical properties of minerals (one hour per week). (*b*) A practical class in which the experiments seen in the lectures are performed by the students (one hour per week).

Text-Book—Chapman's Blowpipe Practice. (Copp-Clark Co.)

Books for Reference—Cornwall's Translation of Plattner's Manual of Qualitative and Quantitative Analysis with the Blowpipe.
Landauer's Blowpipe Analysis.

Students must supply their own blowpipe apparatus.

Second Year.

1. Systematic Mineralogy.
Monday at 2 P.M.

Text-book—Bauerman's Systematic Mineralogy (Longmans, Green & Co.)

Books for reference—Naumann-Zirkel's *Mineralogie.*
Tschermak's *Mineralogie.*
Dana's Text-book of Mineralogy.

2. Crystallography.
Lectures and practical study of crystal forms by means natural crystals and wooden and wire models.
Williams' Crystallography (Henry Holt & Co.)

3. Qualitative analysis of minerals by blowpipe and wet reagents.
Lectures on Qualitative Analysis.

Text-book—Fresenius' Qualitative Analysis.

4. Essays on prescribed subjects.

Third Year.

1. Descriptive Mineralogy.
   Thursday at 2 P.M.
   Description and classification of the commonly occurring minerals, special attention being given to Canadian Ores.

Text-book—Dana's System of Mineralogy. 6th ed.

Books for reference:
Chester's Catalogue of Minerals.
Chapman's Minerals and Geology of Ontario and Quebec. 3rd ed. (Copp-Clark Co.)
Commissioners' Report on Mineral Resources of Ontario, 1890.
Reports of Bureau of Mines, 1891-92-93.

2. Determinative Mineralogy.
   Monday at 3 P.M.
   Practical instruction in the determination of minerals by means of the blowpipe and by field tests.

Text-books—Frazer's Tables for the determination of minerals, 3rd ed., 1891, (J. B. Lippincott & Co., Phila.)
Brush's Manual of Determinative Mineralogy and Blowpipe Analysis, 13th ed. (Wiley & Sons.)

3. Quantitative Analysis of Minerals (selected samples).

Text-book—Fresenius' Quantitative Analysis.

ASSAYING.

Professor: Wm. Nicol, M.A.

The Assaying of gold, silver, copper, lead, zinc, iron, and nickel ores, by furnace, wet, and electrolytic methods.

Text-books—Chapman's Assay Notes, (Copp-Clark Co.)
Brown's Manual of Assaying, 4th ed. (Sargent & Co., Chicago.)
Blair's Chemical Analysis of Iron, 2nd ed. (Lippincott Co.)

Books for reference:
Beringer's Text-book of Assaying (C. Griffin & Co.)
Bodemann & Kerl's Assaying.

METALLURGY.

Professor: William Nicol, M.A.

Ores, furnaces, fuel; the metallurgy of iron, steel, nickel, silver, gold, copper, lead, and aluminum.

Book: Roberts-Austen's Metallurgy.

GEOLOGY.

Lecturer: W. G. Miller, B.A.

Third Year.

Lithological Geology, Classification of Rocks.
Dynamical Geology.
Outline of the Geological History of the Globe, with special reference to the formations found in Canada.
Physical Geography.

The Laboratory work will consist of the preparation of sections of Minerals and Rocks, and their microscopic determination.

During the Fall Term excursions will be made to places of geological interest in the neighbourhood of Kingston.

Essays are required on prescribed subjects.

Students are expected to provide themselves with some elementary book on the subject Le Conte's "Compend of Geology" is recommended.

Books for reference:

Page's or Geikie's Physical Geography.
Dana's Manual of Geology.
Chapman's Minerals and Geology of Central Canada.
Hatch's Petrology.

Fourth Year.

Petrography.
Geology of Canada.
Applied Geology.
Construction of Geological Maps and Sections.
Laboratory, Museum, and Field Work.

Special attention will be paid to the study of the Crystalline Rocks. Frequent excursions will be made to the mines and quarries in the Kingston district.

Books for reference:

Geikie's Field Geology.
Chapman's Minerals and Geology of Canada.
Dawson's Handbook of Canadian Geology.
Phillips' Ore Deposits.
Kemp's Ore Deposits of the United States.
Tarr's Ore Deposits.
Williams' Applied Geology.
Hatch's Petrology.
Rosenbusch's Microscopical Physiography of Rock-forming Minerals.
Zirkel's *Petrographie.*

MECHANISM.

Lecturer: N. F. Dupuis, M.A., F.R.S.C.

Laws of motion ; linkwork, &c.: problems in applied mechanics ; engineering appliances ; the steam engine ; steam pumps, &c.

MINING ENGINEERING AND ORE DRESSING.

Lecturer: Wm. Hamilton Merritt, F.G.S., A.R.S.M.

Mining:

Mineral deposits, prospecting, developing, excavation, explosives, drilling, blasting, shaft sinking, drifting, exploitation, underground transportation, hoisting, drainage, ventilation, lighting, accidents, mine accounts, examination and valuation of mines, and mine surveying.

Ore Dressing:

Physical properties upon which ore dressing operations are based.

Theory of jigging, and slime treatment.

Hand dressing.

Crushing-machinery; jack crushers, stamps, rolls, pulverizers, &c.

Sizing-machinery ; flat and revolving screens, tables, &c.

Typical ore dressing works.

Practical work in the mining laboratory.

MATERIALS AND CONSTRUCTION.

Professor: R. Carr Harris, C.E.

Applied statics ; testing of materials ; properties of materials ; designing and executing of engineering structures ; construction of railways, canals, highways for common roads, and electric ways.

DRAWING.

Lecturer: Wm. Mason.

First Year.

Drawing instruments and materials; descriptive geometry ; projection ; tinting and lettering ; topographical drawing.

Second Year.

Machine drawing ; graphical statics ; designing.

Books for reference: Davidson's Linear Drawing ; Davidson's Projection ; Cryer & Jordan's Machine Construction and Mechanical Drawing.

SURVEYING.

Lecturer: Wm. Mason.

First and Second Years.

Plane, topographical, and railway surveying; calculations; maps and scales; topographical drawing; use and adjustment of surveying instruments; methods of surveying; field work.

Third and Fourth Years.

Plans, profiles, and cross sections; estimates of quantities; methods of contracting and contract payments.

Books for reference: Gillespie's Land Surveying; Trautwine's Engineer's Pocket-Book.

COURSE IN ANALYTICAL CHEMISTRY AND ASSAYING.

Certificates of the School of Mining will be given to all students who pass satisfactory examinations on the following subjects of the M.E. course:—Junior Mathematics, Junior Physics, Junior and Senior Chemistry, Blowpipe Analysis, Drawing (first year), Qualitative Analysis, Quantitative Analysis, Mineralogy, II and III, Crystallography, Geology and Petrography, Ore Deposits, Assaying, and Metallurgy; and in addition analyse qualitatively and quantitatively a selected set of minerals, furnace products, and chemicals.

PROSPECTORS' COURSE.

The School offers to mine foremen, assayers, prospectors, and mining men generally, special courses of instruction, beginning January 8th, 1895, and continuing for eight weeks, as follows:

1. Chemistry.—A course of lectures illustrated by experiments, and accompanied by laboratory practice in which the students will have an opportunity of becoming familiar with common chemical substances, and will learn how to construct and handle apparatus.

2. MINERALOGY.—Lectures dealing with the general principles of mineralogy, and accompanied by practice in identifying minerals by field tests.

3. GEOLOGY.—Lectures on the elements of geology, with illustrations from the geology of Ontario. *Ore deposits* will claim special attention.

4. LITHOLOGY.—The character and modes of occurrence of rocks generally—Examination of hand specimens—Special atttention will be given to the crystalline rocks of Ontario, the more typical mineral-bearing rocks being well represented by specimens in the collection.

5. DISCOVERY AND WINNING OF ORES.—This course will be of particular interest to mining men and prospectors, as it will deal with the application of the principles of chemistry, mechanics, mineralogy and geology to the discovery and winning of valuable minerals, and to the usual methods and machinery in vogue to open up the deposits and exploit and prepare the ore.

6. MILLING.—The class will have opportunities of learning in the *mining laboratory* the use of crushers, stamp mills, and other machinery.

7. BLOWPIPING.—A practical course intended to give facility in the use of the blowpipe for the identification of minerals.

8. ASSAYING.—Opportunities will be given for practice in furnace methods, particularly in the use of the portable assay furnace.

9. DRAWING.—The elements of mechanical and free-hand drawing as applied to surveys of mining claims and mines, to mining plant, &c.

10. ADVANCED WORK.—Those who are prepared for such work may attend (without charge) lectures on the *chemistry of fuels, ores, fluxes and furnaces*, and on *advanced mineralogy* and *geology*. Every facility will be given for work in the chemical, mineralogical, petrographical, and assay laboratories.

FEES.—Every student must pay a registration fee of one dollar. For all the elementary courses (Nos. 1 to 8 inclusive) a fee of ten dollars will be charged; for any one of them two dollars. Fees for the use of the laboratories for advanced work will be in proportion to the number of hours a week; but not to exceed eight dollars.

OTHER EXPENSES.—Good board can be had in the city at from $3.00 to $4.00 a week. The other items of expense (for books, &c.) need not be large.

EXTRAMURAL CLASSES FOR PROSPECTORS AND MINING MEN.

The School of Mining will send lecturers to mining centres to conduct classes in Elementary Chemistry, Mineralogy, and Geology as applied to the discovery and winning of valuable minerals. Sets of apparatus and chemicals will be provided, and those attending these classes will have an opportunity of learning to use the blowpipe for the detection of minerals, and to make silver and gold assays with the blowpipe and with a portable furnace.

For further particulars address

WM. MASON,
Bursar School of Mining, Kingston.

SUMMER SCHOOL OF SCIENCE.

A Summer School of Science for Public and High School teachers, and others, will be opened on July 4th, 1894, and continue in session for five weeks.

The lectures and demonstrations will be given by members of the staff of Queen's University and of the School of Mining and Agriculture.

The object of the school is two-fold; first, to give to Public School and other teachers an opportunity of studying the chemistry, mineralogy, geology, botany and zoology of the farm, as recommended by the Department of Education; and secondly, to enable teachers who cannot attend the University during the winter session to prepare for the practical part of the specialists' examination and the University examinations in the subjects mentioned.

For Public School Teachers.

The work for Public School teachers will consist of courses of lectures, illustrated by experiments, specimens and lantern views; and of practical work in which the students may become acquainted with experimental chemistry, mineralogy, and field geology and botany. Excur-

sions will be made frequently for the purpose of studying the interesting geological features of the region about Kingston, and of collecting and identifying plants.

Chemistry and Physics. A course of 20 lectures, dealing with the principles of chemistry and physics, particularly in their bearing upon agriculture. The subject will be taken up in an elementary way, with illustrations drawn from every-day life, the aim being to show the relation of chemistry to the phenomena of plant and animal life, the fertility of soils, and other subjects of general interest.

Geology and Mineralogy. A course of 20 lectures and demonstrations to illustrate the properties of common minerals, to show how these minerals are built up into rocks, and the rocks disposed in the various layers, &c., which compose the earth's crust.

A few practical lessons will be given in testing minerals by the blowpipe.

Botany. A course of 10 lectures on plant life and plant structure, with especial reference to such plants as are beneficial or inimical to the agriculturist, such as cereals, fruit trees, tubers, weeds, smut, rust, mildew, &c.

Zoology. A course of 10 lectures on animals of the farm, their uses and treatment, and upon the insect pests which infest the garden and the field, and the best means for their exclusion or extermination.

Physiology. A course of 5 lectures on human physiology, including respiration, circulation of the blood, digestion, &c.

Fees: for lectures, $4.00; for registration, $1.00.

For High School Teachers.

The laboratories of the School of Mining will be open to High School teachers and others for the practical study of chemical analysis, crystallography, mineralogy, blowpiping and assaying. Students will be assisted in this work by members of the staff.

Also, a course of lectures will be given upon elementary coordinate geometry, or any other part of mathematics, if such a course is desired by a sufficient number.

Fees. A fee of $6.00 will be charged for the use of the laboratories. Every student doing blowpipe work must supply his own apparatus; good sets can be bought in Kingston for $7.50. A limited number of sets may be loaned by the school, a deposit of $4.00 being required in such cases. Registration, $1.00.

Other Expenses. Board can be obtained in Kingston for $2.50 a week and upward. Expenses for books and stationery need not be more than trifling.

It is proposed to hold a Summer School again in July, 1895, when other subjects may be added to the curriculum. Correspondence is invited.

Persons wishing to attend the Summer School should make application at once to William Mason, Registrar of the School of Mining at Kingston, Ont.

LABORATORIES.

The School is provided with *chemical* laboratories, an *assay*, a *blowpipe*, and a *petrographical* laboratory. There will be built during the summer a *mining laboratory* and experimental reduction works, which will be furnished with a stamp mill, concentrators, separators, amalgamators and other machines with which ores are treated at the mines. In selecting these machines, local and provincial rather than general conditions will be kept in view. The machines will be of sufficient size to operate upon large quantities of ore; and those opening up mines are invited to send in large samples of ore (a ton is a good sample) to be put through a milling process in order to test the suitability of the process for their ores. In this way, costly mistakes may be avoided. The School is prepared to undertake such tests and will charge only for running expenses.

MINERAL AND GEOLOGICAL SPECIMENS.

It is desired to make the collections of this School as complete and representative as possible of the mineral resources of Canada. Specimens sent to the school will be named free of charge. Good specimens presented to the school will be labelled with the name of the donor and the locality, and will be preserved for reference.

Samples under 25 lbs. in weight may be sent by express ;—over that weight, by freight.

Specimens should be addressed to the Professor of Mineralogy or to the Lecturer on Geology, School of Mining, Kingston, Ont.

DONATIONS OF MINERALS, &c.

1. Samples of Iron Ores from Coe Hill Mine, Wallbridge Mine, &c. Samples of Argentiferous Arsenopyrite from Madoc. From Mr. F. B. McMullen, Ph.B., Chicago.

2. Samples of Pyrolusite from Manganese Mine, Tennycape, N.S. From Mr. D. W. McVicar.

3. Samples of Minerals. From Mr. Robert Flynn, Mountain Grove.

4. Collection of Niagara and Clinton Fossils from Hamilton. From Col. Grant, Hamilton, Ont.

5. Specimens of Calamite and other Coal Plants from Wallace, N.S. From Mr. E. P. Goodwin, Baie Verte, N.B.

6. Samples of Actinolite and associated minerals. From Mr. J. E. Harrison, Bridgewater, Ont.

7. Samples of Silver Ore from Comstock Lode, Nevada. From Mr. W. A. Stevenson, Kingston.

8. Samples of Auriferous Arsenopyrite from Deloro. Specimen of Silicified Wood from South Dakota. From Mr. C. G. Rothwell, Kingston.

9. Samples of Auriferous Pyrite. From Mr. T. D. Ledyard, Toronto.

10. Specimens of Lithographic Stone. From Mr. E. G. Cowan, Marmora.

11. Samples of Talc from Palmer Mine, Gouverneur, N.Y. From Mr. J. E. Harrison, Bridgewater, Ont.

12. Samples of Minerals. From Mr. Wm. H. Wylie, Marmora.

13. Samples of Ore from Township of May, Massey Station, Algoma District. From Mr. D. G. McDonald.

14. Samples of Hematite, Ankerite, Coke, Limonite, &c. From Mr. R. G. Leckie, General Manager Londonderry Iron Company, N.S., Ltd.

15. Thirteen Cases of Minerals. From the Government of Ontario.

16. Samples of Iron and other Ores. From Mr. D. Williams, P.L.S., Kingston.

17. Samples of Minerals. From Mr. W. Kidd, Kingston.

18. The Canadian Collection of Fossils exhibited at the Chicago World's Fair. From the Dominion Government.

DONATIONS OF BOOKS.

1. Publications of the Geological Survey of Canada, Reports, Maps, Catalogues, &c., from 1876 to 1893. From the Dominion Government.

2. Reports, Maps, Catalogues, &c., from 1862 to 1893. From Rev. Dr. Williamson.

3. Mesozoic Fossils, Vol. I., 1876. From Rev. Prof. Fowler.

4. Historical and Scientific pamphlets (43 in number), from 1882 to 1893. From Manitoba Historical and Scientific Society.

5. Reports of Royal Commission, N.S.W., 1885-88. From Principal Grant.

6. Report of the Chief Engineer of Canals, 1880. From Professor Carr Harris.

7. Report of Royal Commission on Mineral Resources of Ontario, 5 copies.

8. Second Report of the Bureau of Mines, 1892, 7 copies.

9. Transactions of the Mining Society of Nova Scotia, 1892-3.

EXAMINATIONS FOR THE DEGREE OF MINING ENGINEERING.

The following have passed :—

1st Year.

REGINALD INSTANT,

WALTER LAVELL,

R. W. ANGLIN,—except in Blowpiping.

H. S. BAKER,—except in Junior English.

G. D. CAMPBELL,—except in Blowpiping.

PROSPECTORS' CLASS.

The following received certificates :—

FREDERIC S. J. BROOME, Muskoka Falls.

JNO. DONNELLY, JR., Kingston.

R. J. MCDOWALL, "

E. M. MORGAN, M.D "

C. G. ROTHWELL, Arizona.

W. H. STEVENSON, Kingston.

DEPARTMENT OF NAVIGATION.

Navigation.—Provision will be made for two classes of students. (1) A pretty complete course involving both the mathematical and physical knowledge of the subjects, together with the practical portions as far as they can, under the circumstances, be given by practical masters of the subjects. (2) A short course for students who wish, in as little time as possible, to acquire a sufficient knowledge, chiefly of the practical parts, to make them useful, as assistants at least, in the pursuit of navigation.

The practical navigation will be under the direction of a master mariner, whose ability as such has brought its reward; and as Kingston is the most important shipping port in Ontario, the facilities for getting experience in navigation during the season are many.

THE SCHOOL OF AGRICULTURE.

DAIRYING DEPARTMENT.

A School for Instruction in cheese making and production of creamery butter will be opened early in December, 1894, and be continued, in short sessions of two or three weeks each, until April, 1895. It is intended to give practical instruction to those who have already some knowledge of the manufacture of these products. It is expected that the Dominion Department of Agriculture, through Professor Robertson, Commissioner of Dairying, will conduct the making of cheese and butter throughout the entire course. A building will be erected on the grounds of the School of Agriculture, corner Barrie and Clergy streets, especially equipped for practical work. Further particulars as to the character and duration of classes and as to fees can be had on application to the Bursar.

VETERINARY DEPARTMENT.

The object in establishing this department is twofold: (1) to give to students such a knowledge of the diseases of domestic animals as will enable its graduates to practice the profession of Veterinary Surgeons, and (2) to give to farmers' sons and stock raisers such an elementary knowledge of Veterinary Science as will enable them to treat their stock intelligently, breed them scientifically, and in case of serious sickness administer temporary relief until a regularly qualified Veterinary Surgeon can be sent for.

In trying to accomplish these objects the teaching staff will endeavor to lay a broad foundation by imparting as thorough a knowledge as possible of comparative anatomy, physiology and pathology. The latter subject will receive special attention because some contagious diseases are common to man and to the domestic animals, and other diseases which are not contagious, but caused by an animal's surroundings, develop similar symptoms and run a similar course in the lower animals as in man.

BUILDINGS.

The buildings stand at the corner of Barrie and Clergy streets, and with the grounds are the generous gift of the city to the School of Mining and Agriculture. The property was valued at $20,000 three years ago. The main building consists of ample class rooms, a waiting room, reading room and dissecting room. Close to it is the Infirmary for Sick Animals.

ANNOUNCEMENTS.

Students are admitted and allowed to go on with their professional studies without being subjected to any examination in general knowledge, but *before presenting themselves for the first professional examination* they will be required to undergo an examination on the following subjects :

1. Reading.
2. Arithmetic, the Simple Rules and Fractions.
3. Ability to write a letter or essay on a given subject.
4. Elementary English History and Canadian Geography.

Candidates for admission who present certificates of having passed any of the examinations of the Education Department of Ontario, or any College or University examination, or a certificate from a Public School Inspector or teacher of having passed the promotion examination of the 4th class of a public school will be exempt from the above Examination.

The authorities of the School retain the right of refusing to admit any intending student whose character will not bear investigation, and of refusing to re-admit any student who during the previous session has not conducted himself to their satisfaction.

FEES.

First Session Tuition Fee	$50 00
Dissecting Room and Apparatus	5 00
Total	$55 00
Second Session Tuition Fee	$50 00
Dissecting Room and Apparatus	5 00
Total	$55 00

Attendance for a third session or part of a session, $30.00.

All fees are payable in advance, and must be paid by the students personally as they enrol or be directly remitted by their parents or guardians to the Bursar.

Board can be obtained at from $3.00 to $3.50. per week.

Occasional students are not required to undergo any examinations. They will be allowed to attend any one class on payment of a fee of $12.00 per session.

COURSE OF STUDY.

The period of study extends over two winter sessions and includes a full course of lectures and demonstrations on the following subjects: Anatomy, Chemistry, Physiology, Materia Medica and Therapeutics, Normal and Pathological Histology, Diseases of Domestic Animals, and Comparative Pathology.

Students must attend at least 75 per cent. of the lectures on each of these subjects during both sessions.

Practical Anatomy will be taught daily in the dissecting room under the superintendence of the professors or demonstrators. A certificate stating the amount of dissection done will be given to each student at the close of the session, and no student will be allowed to present himself for his second professional examination until he has dissected the horse's body at least once.

All students during their course will be required to discharge in turn the duties of dressers, prosectors, dispensers and visitors.

PROFESSIONAL EXAMINATIONS.

Before being awarded the diploma in Veterinary Science a student must pass two professional examinations, one at the end of the first session and one at the end of the second.

The subjects of the first professional examination are Anatomy (the bones and ligaments of the common domesticated animals), Physiology and Chemistry.

The subjects of the second professional examination are Anatomy, Physiology, Chemistry, Materia Medica and Therapeutics, Diseases of Domestic Animals, and Pathology.

Graduates or undergraduates in Arts, Science or Medicine of any university in Canada or the United States, and graduates and undergraduates of a college of Pharmacy, Dentistry or Agriculture, who have attended courses of lectures and passed examinations equivalent to those required by the curriculum of this school will be allowed to graduate on completing the curriculum, paying the required class fees and passing the final examination.

TEXTS BOOKS RECOMMENDED.

Students are advised not to buy text books till after consultation with the professor who teaches the subject.

Anatomy.—Strangeway's Veterinary Anatomy.

Physiology.—Huxley's Elementary Lessons.

Histology.—Schafer's Essentials.

Chemistry.—Goodwin's.

Medicine and Surgery.—Williams' Principles and Practice of Veterinary Medicine: Williams' Surgery: Fleming's Veterinary Obstetrics.

Materia Medica.—Dunn's Veterinary Medicines: Walley's Veterinary Conspectus.

Cattle Diseases.—Steel's Bovine Pathology: Clatter's Cattle Doctor.

Diseases of the Dog.—Hill.

Entozoa.—Cobbold's Entozoa of the Domestic Animals.

Pathology.—Payne: Green.

Dictionary.—Gould's Medical Dictionary.

Biology.—Dr. Campbell's Introduction to Elementary Biology (Macmillan & Co.)

VETERINARY PRACTICE.

The lectures will be so arranged as to allow ample time for practical work under the direction of the Veterinary Staff, such as Patient Visiting, Clinical Instruction, Examination of Horses as to Soundness, Surgical Operations, Post Mortem Examinations, Practical Examination of Feet for Lameness, etc.

The Veterinary practice in connection with the School Infirmary for Sick Animals, and in connection with the private practice of the professors, will be such as to afford opportunities for students to obtain a good practical knowledge of their profession.

All the medicines used in the practice of the Infirmary will be compounded by the students under the direction of the professors. They are advised to practice during the summer vacation under the supervision of a qualified practitioner.

Students will be allowed to visit the Museum of the Medical Faculty of Queen's University, and may borrow books from the University library under the usual University regulations.

For date of opening and other particulars apply to the Bursar.